New Mexico EIB Hearing

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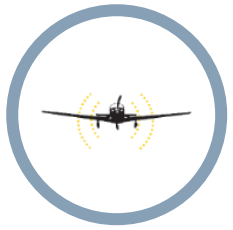
EDF
ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

EDF's Permian Methane Analysis Project

- Collaboration with leading scientists to assess emissions and facilitate mitigation
- Uses multiple measurement approaches in NM and TX Permian since late 2019
- Rapidly posts data on PermianMAP.org

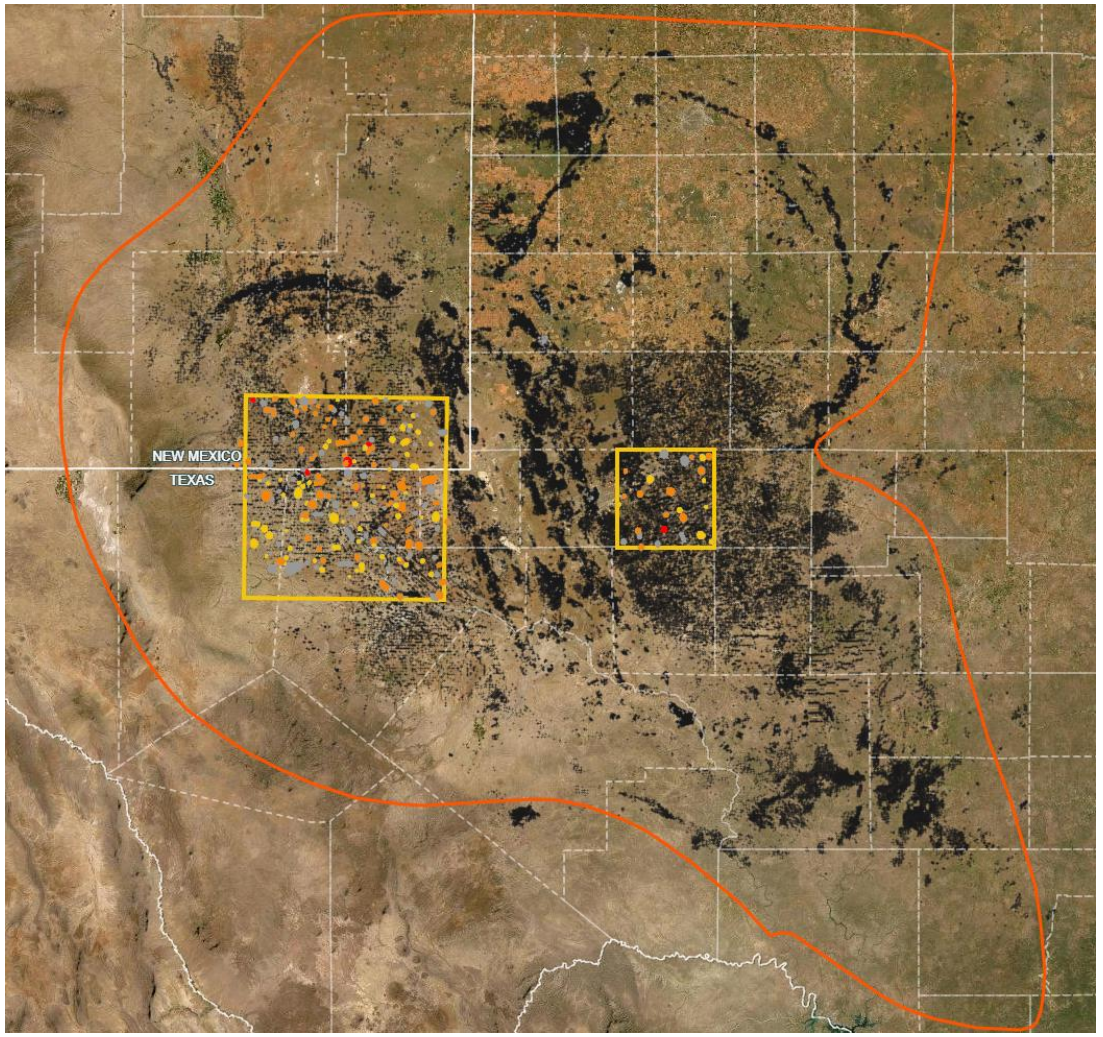


Scientific Aviation
Carbon Mapper
Aerial mass balance and remote sensing

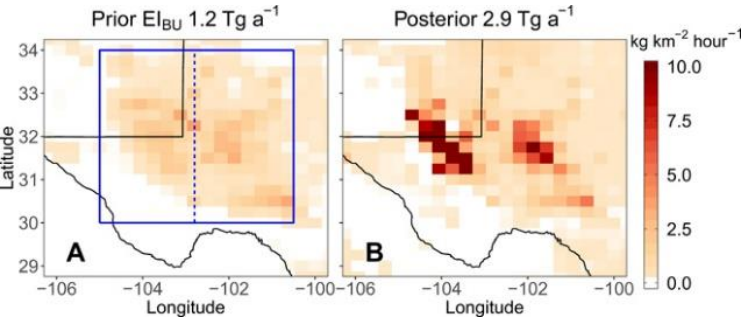
Penn State U.
Tower-based, regional estimates

U. of Wyoming
Vehicle-based, site-level estimates

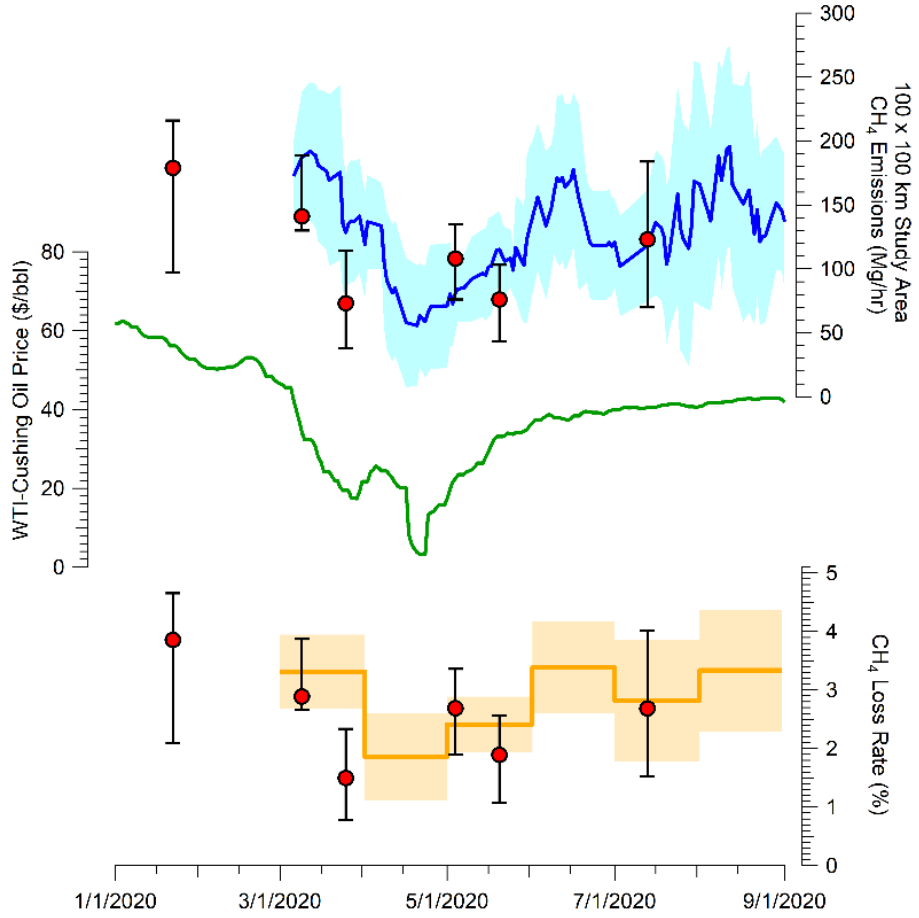
Leak Surveys Inc.
Helicopter-based optical gas imaging



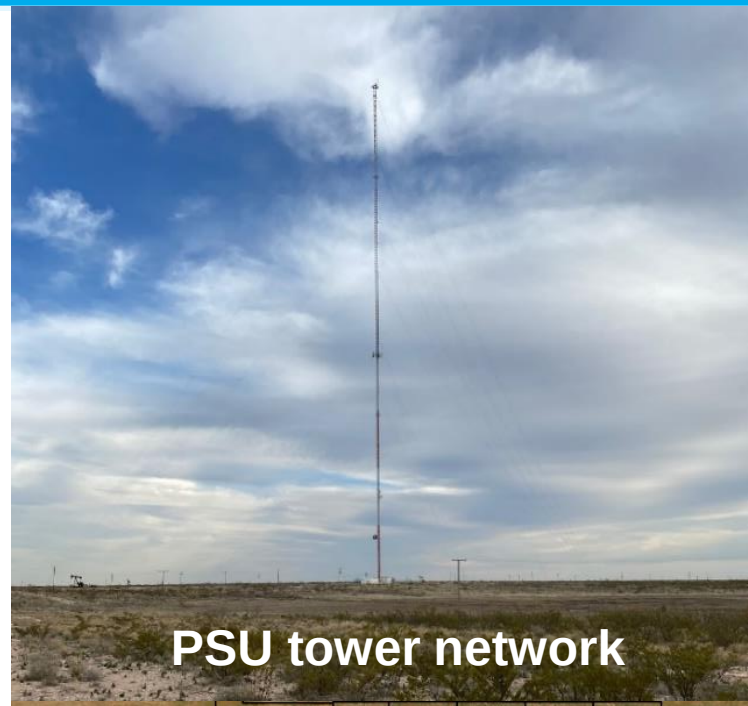
Permian Basin methane emissions are >3% of natural gas production.

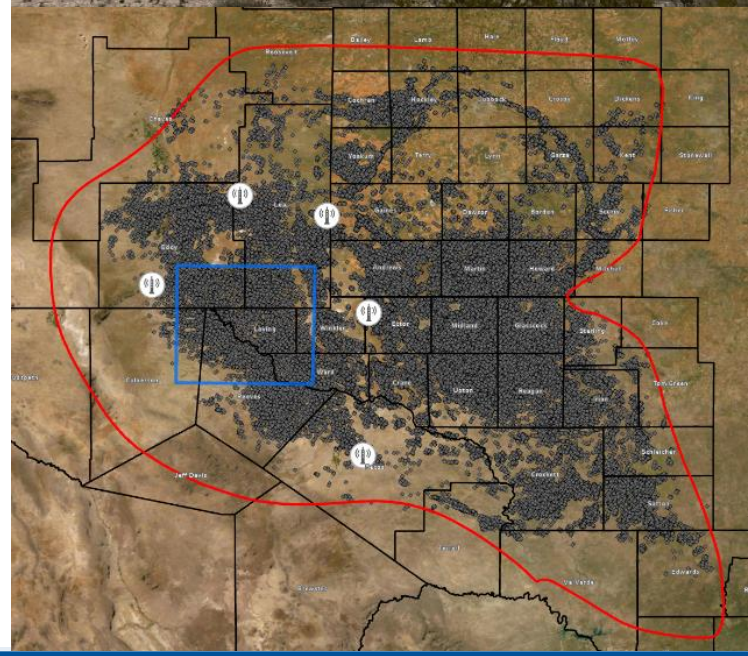


Zhang et al 2020

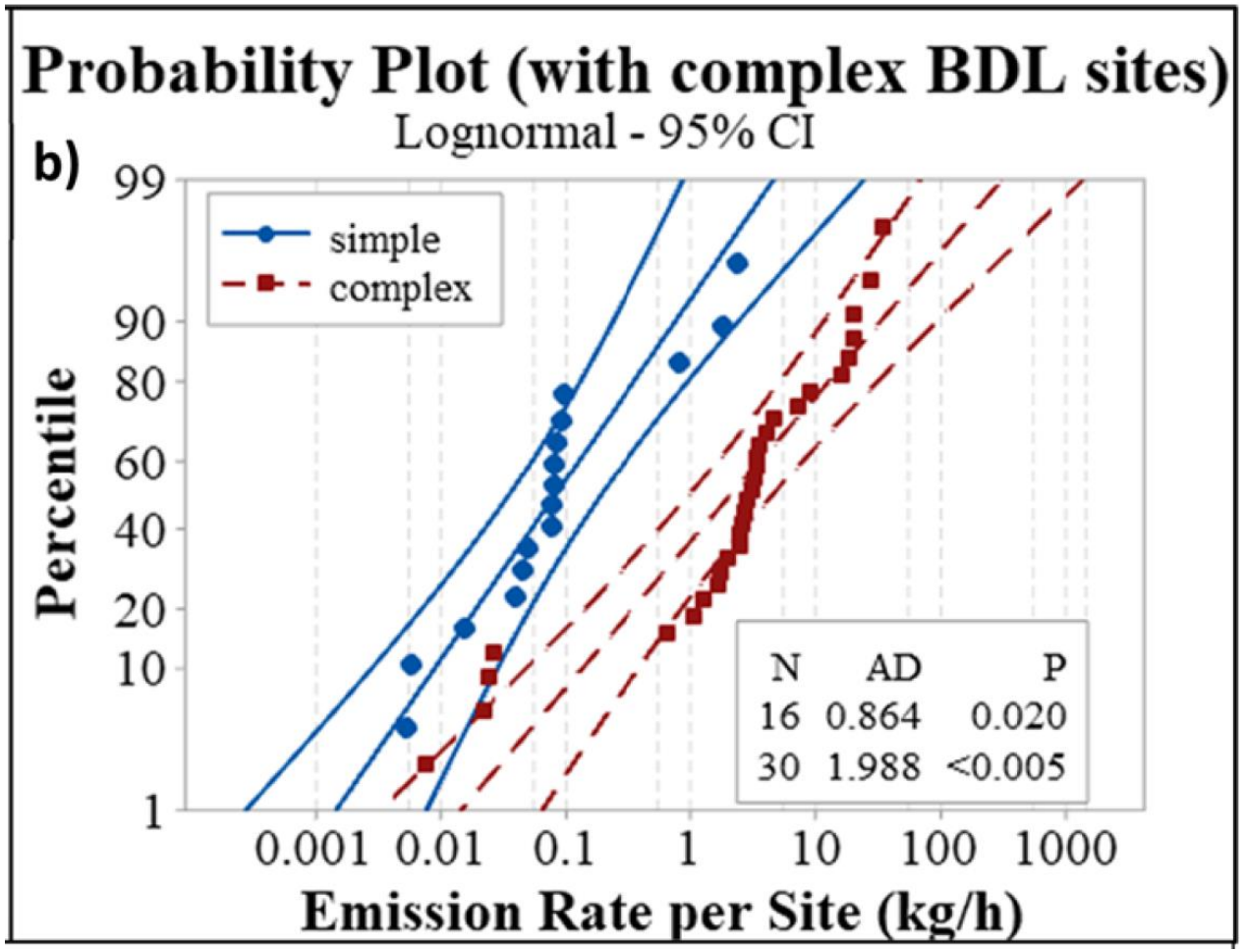


Lyon et al 2021: [10.5194/acp-21-6605-2021](https://doi.org/10.5194/acp-21-6605-2021)



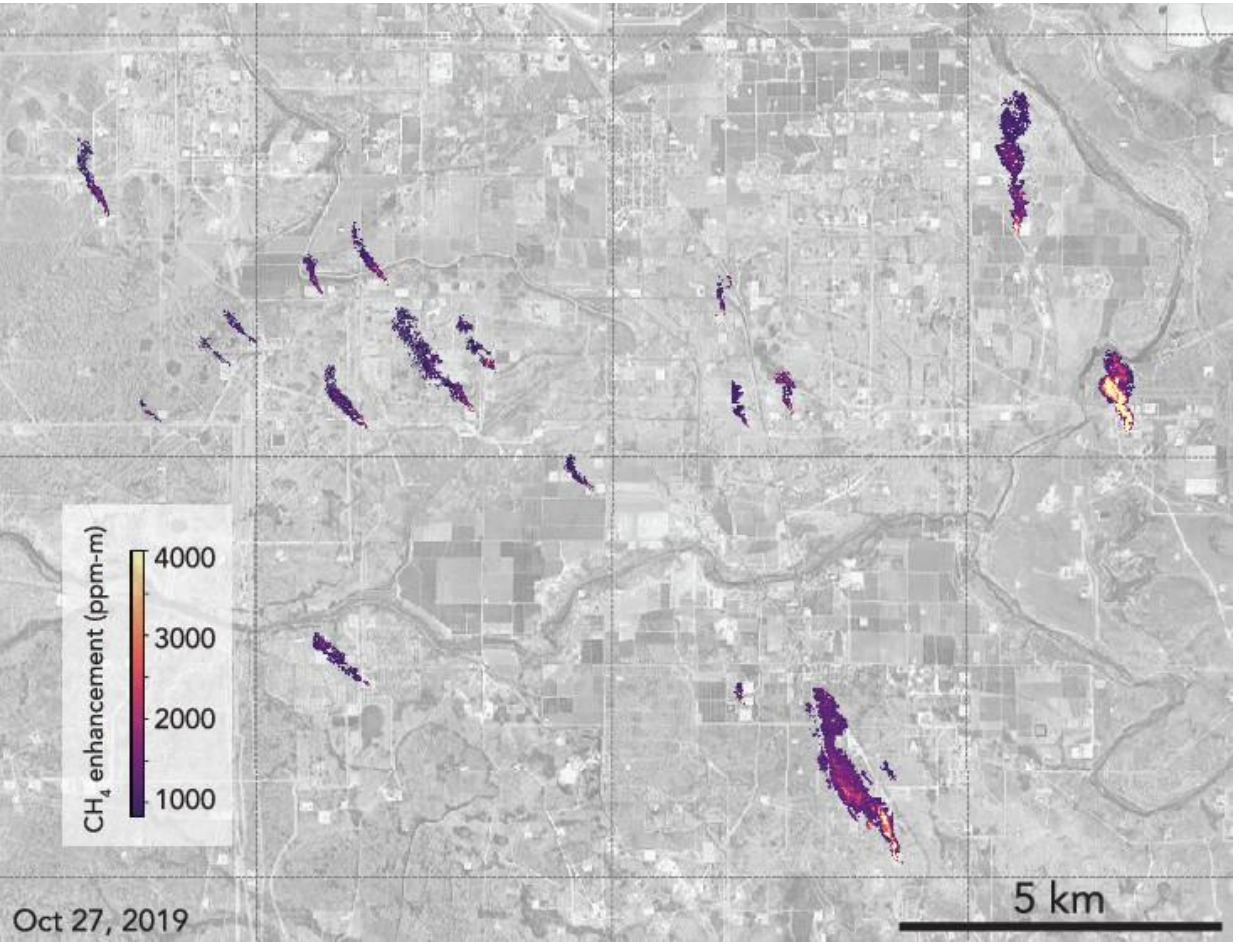


Measurement-based NM Permian well pad methane emissions are 5 – 9X higher than EPA estimates.

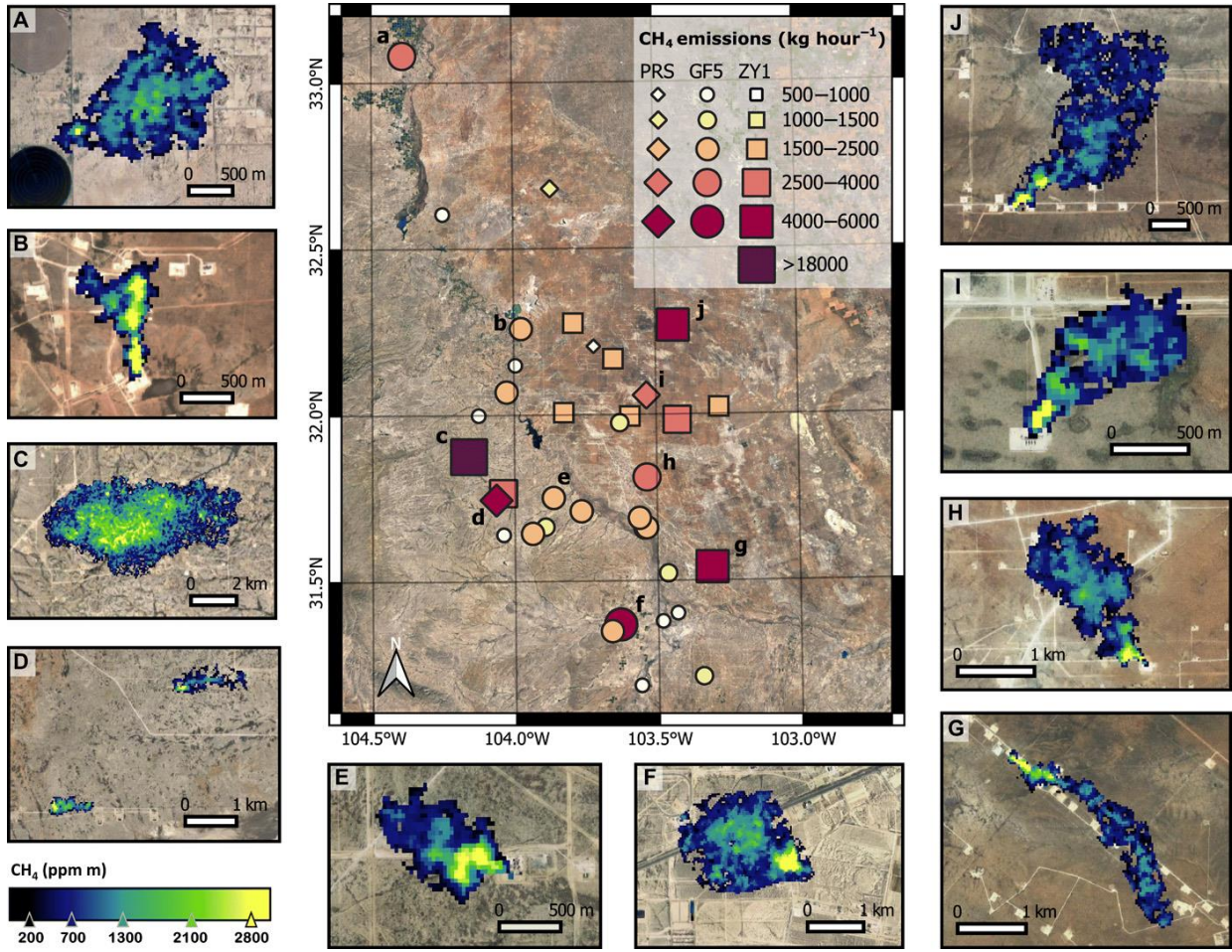


Robertson et al 2021: [10.1021/acs.est.0c02927](https://doi.org/10.1021/acs.est.0c02927)

Aerial and satellite approaches have recently measured many large methane emission sources in the Permian.



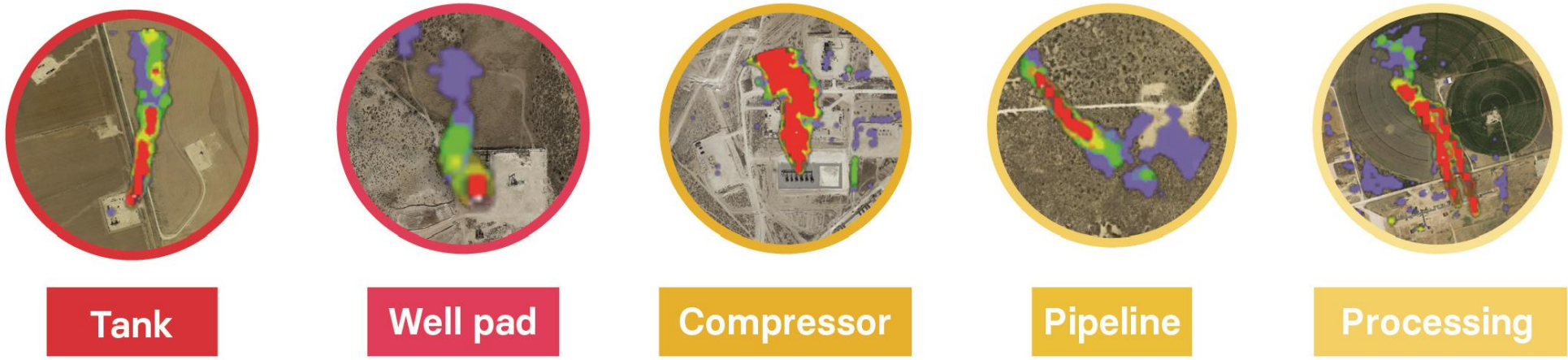
Cusworth et al 2021 [10.1021/acs.estlett.1c00173](https://doi.org/10.1021/acs.estlett.1c00173)



Irakulis-Loitxate et al 2021 [10.1126/sciadv.abf4507](https://doi.org/10.1126/sciadv.abf4507)

Carbon Mapper completed two weeks of aerial surveys in the Permian Basin in early August 2021

- Measured ~900 methane plumes from 500 sources
- Many sites had plumes detected over multiple surveys
- Emissions detected from diverse sites and equipment



Explore all the data at PermianMAP.org

Helicopter-based optical gas imaging can identify malfunctioning flares and other large emission sources.

Leak Surveys, Inc.

Malfunctioning flares are common problem and large emission source.

- >1000 flares surveyed with helicopter-based optical gas imaging
- ~5% of flares were unlit and venting and another 5% had combustion issues
- Overall combustion efficiency estimated at ≤93% and with flares contributing ≥10% of basin methane emissions